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[Elemental composition in soft tissues as a model for identifying batches of juvenile Atlantic bluefin tuna \(*Thunnus thynnus* \)](#)

. Journal of Food Composition and Analysis Volume 118, May 2023
<https://doi.org/10.1016/j.jfca.2023.105176>

Abstract: Integral Atlantic bluefin tuna (*Thunnus thynnus*) aquaculture will become a reality in the coming years and so tuna batches will have to be clearly identifiable to avoid commercial fraud and ensure this species' conservation. Consequently, the objective of this study was to analyse the components of juvenile bluefin tissue to be able to discriminate between three tuna batches: specimens born in captivity and raised in inland facilities (onshore tanks), fish born in captivity and raised in the sea (sea cages), and wild tuna. Ten macro and trace elements (Ca, Fe, K, Mg, Na, P, S, Cu, Mn and Zn) were selected, and their concentrations were analysed in four soft tissues: liver, kidney, brain and muscle. Only one of the elements (Cu) showed statistically significant differences for fish batch in all tissues, so multivariate tests (Principal Component Analysis, PCA and Canonical Discriminant Analysis, DCA) were performed. In the PCA, there were partial batches separation in kidney and muscle. In DCA, the percentage of cases correctly classified using this validation were 60.8 % (liver), 88.6 % (kidney), 79.5 % (muscle) and 82.2 % (brain). Globally, muscle appear to be the best tissue for discriminating the batch of tunas, and wild specimens are the most readily identifiable.

Keywords:Bluefin tuna, Food analysis, Food composition, Soft tissues, Trace elements